Chapter 3
Without-Project Conditions

3-1. Overview

This chapter presents hydrologic engineering requirements for performing existing and future without-project condition analyses as described by ER 1105-2-100. The results represent the base conditions for determining the economic value, performance, and environmental/social impacts of flood damage reduction measures and plans. Base conditions should be established in final detail as early in the process as possible to provide a stable basis of information and plan comparison. Table 3-1 presents a checklist that summarizes critical requirements for hydrologic engineering analysis for without-project conditions. This list and checklists in subsequent chapters are included as aids to ensure that nothing is left to chance. In most cases, the list items are described in more detail in the chapter. Some items, however, are listed just as a reminder to ensure that details will not be overlooked.

3-2. Layout

Hydrologic engineering plays an important part in the study setup and layout as described in paragraph 2-2. The layout for the existing without-project conditions is crucial to the overall study. Preliminary efforts define the study limits, review available information, and establish a field presence. These activities assist with development of the HEMP described in paragraph 1-7 and the initial definition of potential measures and plans to evaluate. Subbasins are delineated based on stream topology, gauge, sites, runoff characteristics, and locations of existing and potential measures. Assistance is provided to economists in estimating the maximum extent of flooding for structure inventories and defining damage reaches.

3-3. Technical Analyses

Hydrologic engineering investigations develop information that defines the flood characteristics used in the economic analysis and determination of the performance and environmental/social impacts of the existing system.

Table 3-1
Checklist for Without-Project Conditions

Hydrologic Engineering Study Components	✓	Issues
Layout		Review/assemble available information
		Conduct field reconnaissance for historic flood data and survey specification
		Establish local contacts
		Assist in establishing study limits, damage reaches
Economic Studies		Determine existing and future without-project conditions discharge-frequency and associated uncertainty
		Determine existing and future with-project conditions stage-discharge and associated uncertainty
Performance		Determine expected annual exceedance probability
		Determine expected lifetime exceedance probability
		Evaluate existing project operation/stability for range of events and key assumptions
		Describe consequences of capacity exceedances
		Determine event performance
		Formulate OMRR&R plan and prepare O&M manual to include existing system surveillance and flood fighting
Environmental and Social		Evaluate without-project riparian impacts
		Evaluate without-project social impacts

Information to be generated includes discharge-frequency, stage-discharge, flood inundation boundaries, warning times, and the variability of flooding (shallow or deep, swift or slow, debris and sediment laden, ice, etc.). The information is developed using previously described conventional studies. Uncertainties of the discharge, stage, and damage functions are determined for the existing without-project conditions. These relationships form the basis of estimating uncertainties for the future without-project and with-project conditions. Risk-based analyses are then performed to obtain economic and performance information. The nature of flooding and determination of the magnitude of major damage locations provide insights to the type and range of costs of potential flood damage reduction measures.